

10/655 974

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,817,716 B1
DATED : November 16, 2004
INVENTOR(S) : Stephen P. Hines

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It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

The title page, showing the illustrative figure should be deleted and substitute therefor, the attached title page.

Delete drawing sheets 1-21 and substitute therefor, the drawing sheets 1-21 as shown on the attached pages.

Signed and Sealed this

Twenty-ninth Day of March, 2005

A handwritten signature in black ink, reading "Jon W. Dudas". The signature is stylized, with a large, looped initial "J" and a cursive "Dudas".

JON W. DUDAS
Director of the United States Patent and Trademark Office

(12) **United States Patent**
Hines

(10) **Patent No.:** **US 6,817,716 B1**
(45) **Date of Patent:** **Nov. 16, 2004**

(54) **AERIAL-IMAGE DISPLAY SYSTEMS**

(76) **Inventor:** **Stephen P. Hines, 4525-B San Fernando Rd., Glendale, CA (US) 91204**

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) **Appl. No.:** **10/655,974**

(22) **Filed:** **Sep. 5, 2003**

Related U.S. Application Data

(63) Continuation of application No. 09/687,618, filed on Oct. 13, 2000, now abandoned.

(60) Provisional application No. 60/159,223, filed on Oct. 13, 1999.

(51) **Int. Cl.⁷** **G03B 21/00; G03B 21/26; G02B 27/14**

(52) **U.S. Cl.** **353/10; 353/7; 353/28; 359/631**

(58) **Field of Search** **353/10, 7, 28; 359/629-631**

(56) **References Cited**

U.S. PATENT DOCUMENTS

243,813 A	7/1881	Taylor	359/448
1,699,689 A	1/1929	Curry	40/538
2,490,747 A	12/1949	Creighton	356/251
2,576,147 A	11/1951	Sauvage	40/427
3,096,389 A	7/1963	Dudley	359/871
3,443,858 A	5/1969	La Russa	359/494
3,493,290 A	2/1970	Traub	359/479
4,093,347 A	6/1978	La Russa	359/630
4,200,366 A	4/1980	Freeman	353/78
4,348,187 A	9/1982	Dotsko	434/44
4,671,625 A	6/1987	Noble	359/726

4,859,031 A	8/1989	Berman et al.	349/11
5,214,458 A	5/1993	Kanai	353/63
5,311,357 A	5/1994	Summer et al.	359/479
5,430,474 A	7/1995	Hines	348/42
5,457,508 A	10/1995	Ichihara et al.	353/10
5,477,394 A	12/1995	Shibasaki	359/858
5,483,307 A	1/1996	Anderson	353/98
5,552,934 A	9/1996	Prince	359/629
5,671,992 A	9/1997	Richards	353/7
5,782,547 A	7/1998	Machtig et al.	353/28
5,886,818 A	3/1999	Summer et al.	359/478
5,940,167 A	8/1999	Gans	352/43
5,944,403 A	8/1999	Krause	353/74
6,042,235 A *	3/2000	Machtig et al.	353/28
6,147,805 A	11/2000	Ferguson	359/630
D435,043 S *	12/2000	Hines	D14/304
6,211,613 B1	4/2001	May	313/504
6,292,305 B1	9/2001	Sakuma et al.	359/649
6,318,868 B1 *	11/2001	Larussa	359/857

FOREIGN PATENT DOCUMENTS

CH	67934	1/1992
WO	WO 89/09423	10/1989

* cited by examiner

Primary Examiner—David Gray

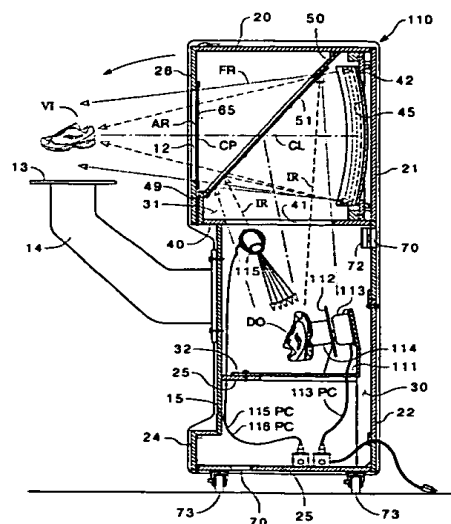
Assistant Examiner—Magda Cruz

(74) *Attorney, Agent, or Firm*—John E. Wagner

(57) **ABSTRACT**

Apparatus for producing aerial-images is disclosed employing a combination of focusing reflectors, beamsplitter polarizing filters, and light sources. An object to be displayed is illuminated, and its image partially reflected by the beamsplitter to a focusing mirror and reflected to an aerial position. A polarizer prevents ambient light or images from degrading or interfering with the aerial-image. A clock radio, personal television display counter, as well as animated mannequin versions are disclosed.

14 Claims, 21 Drawing Sheets



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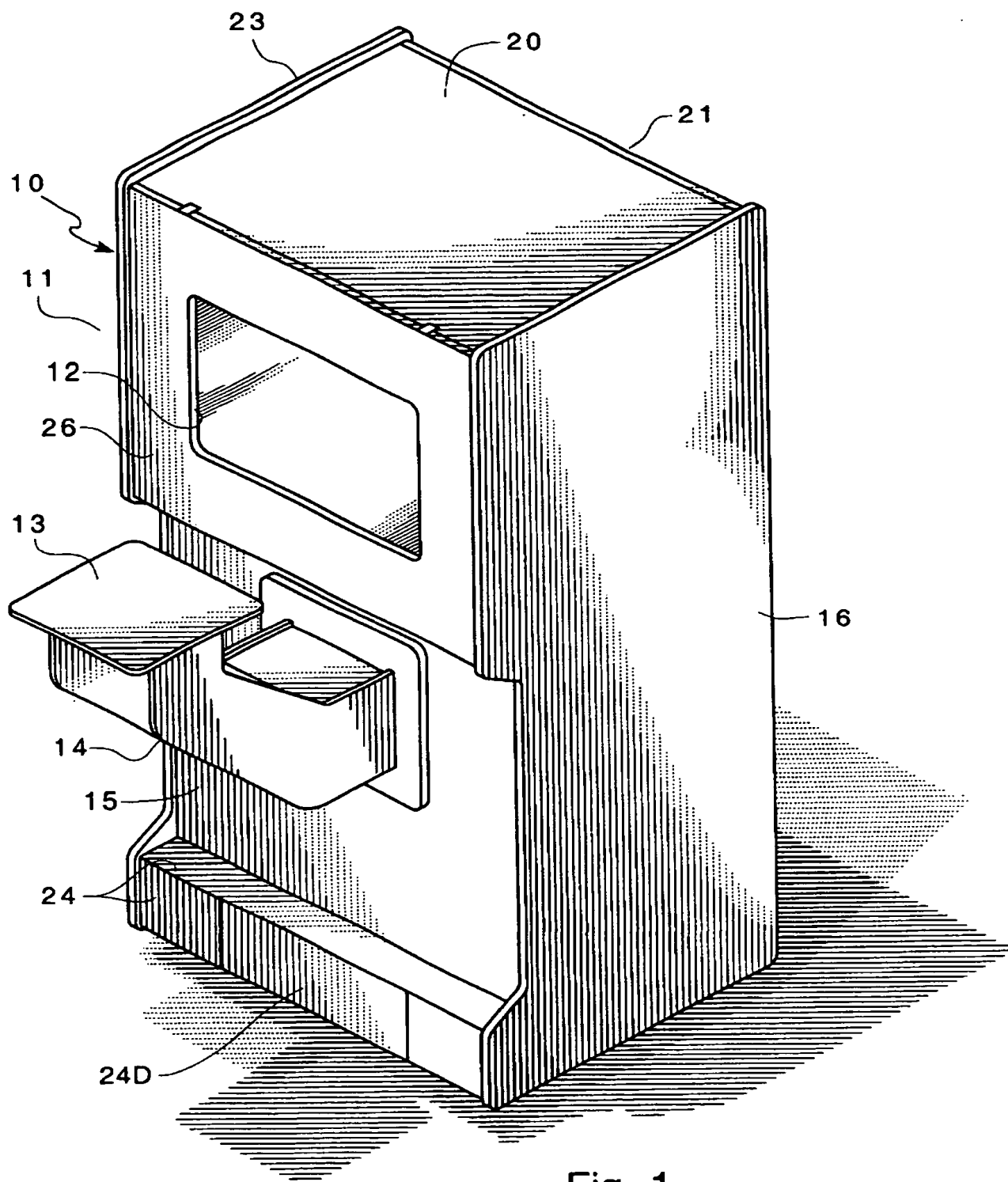


Fig. 1

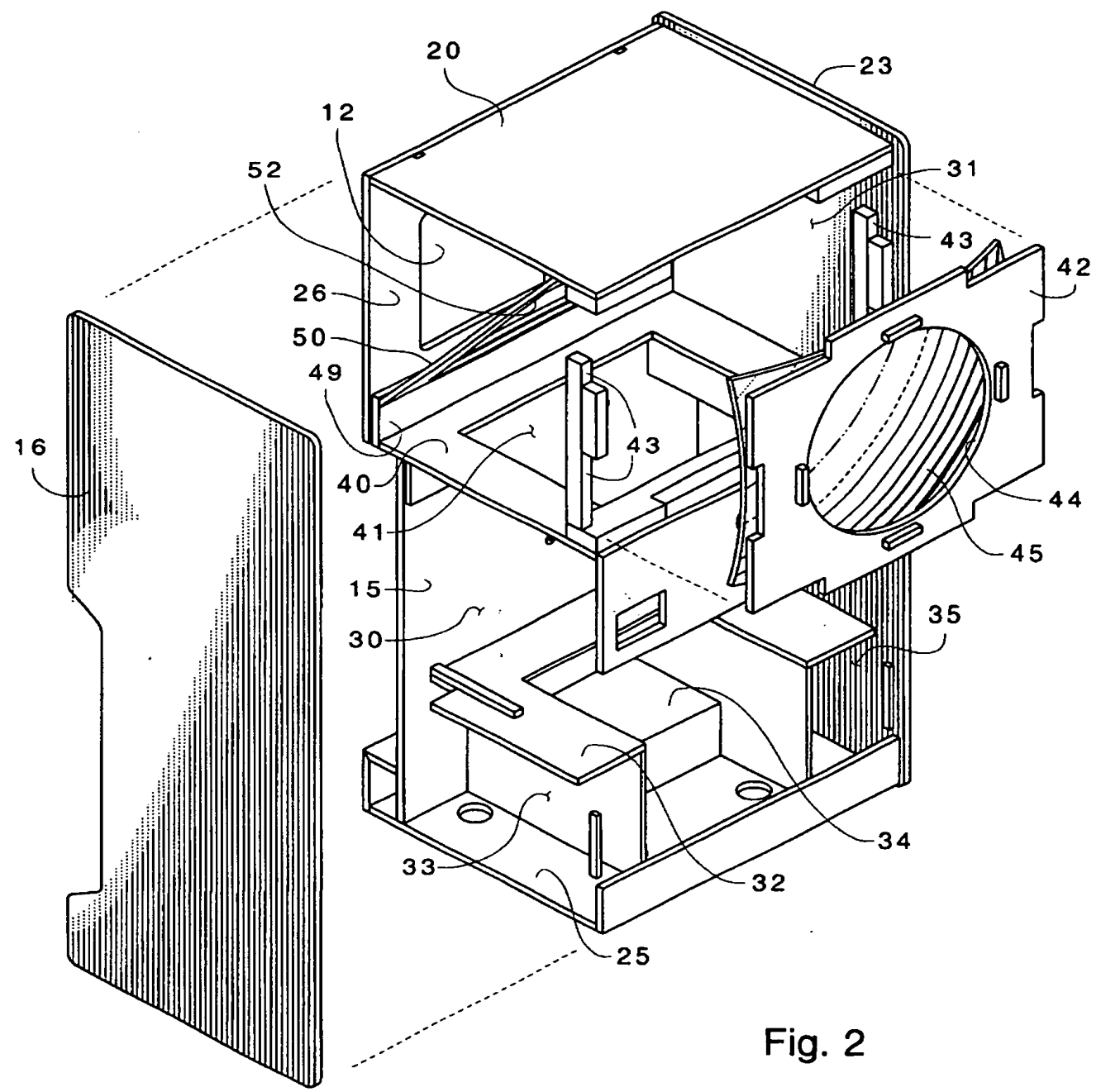


Fig. 2

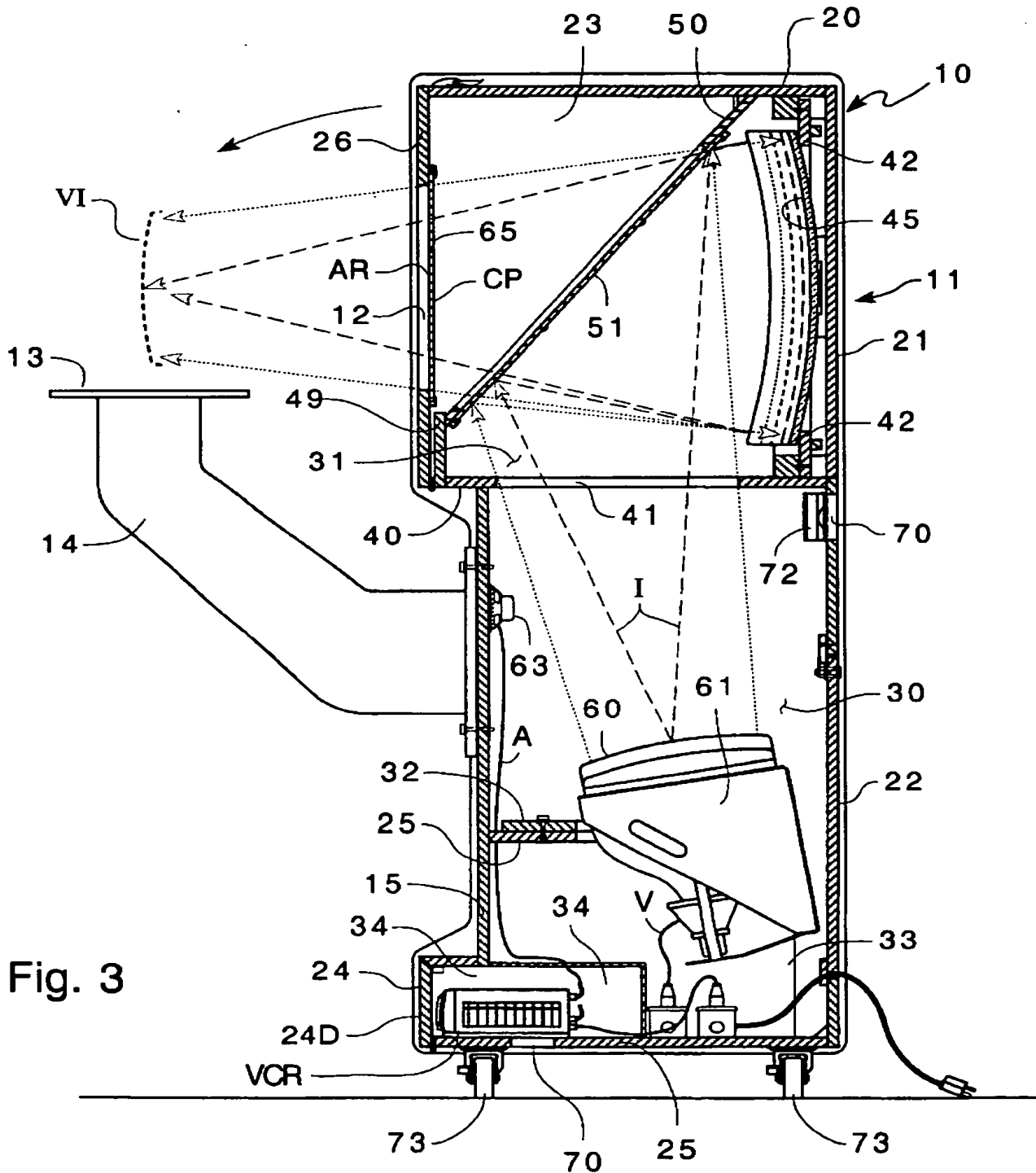


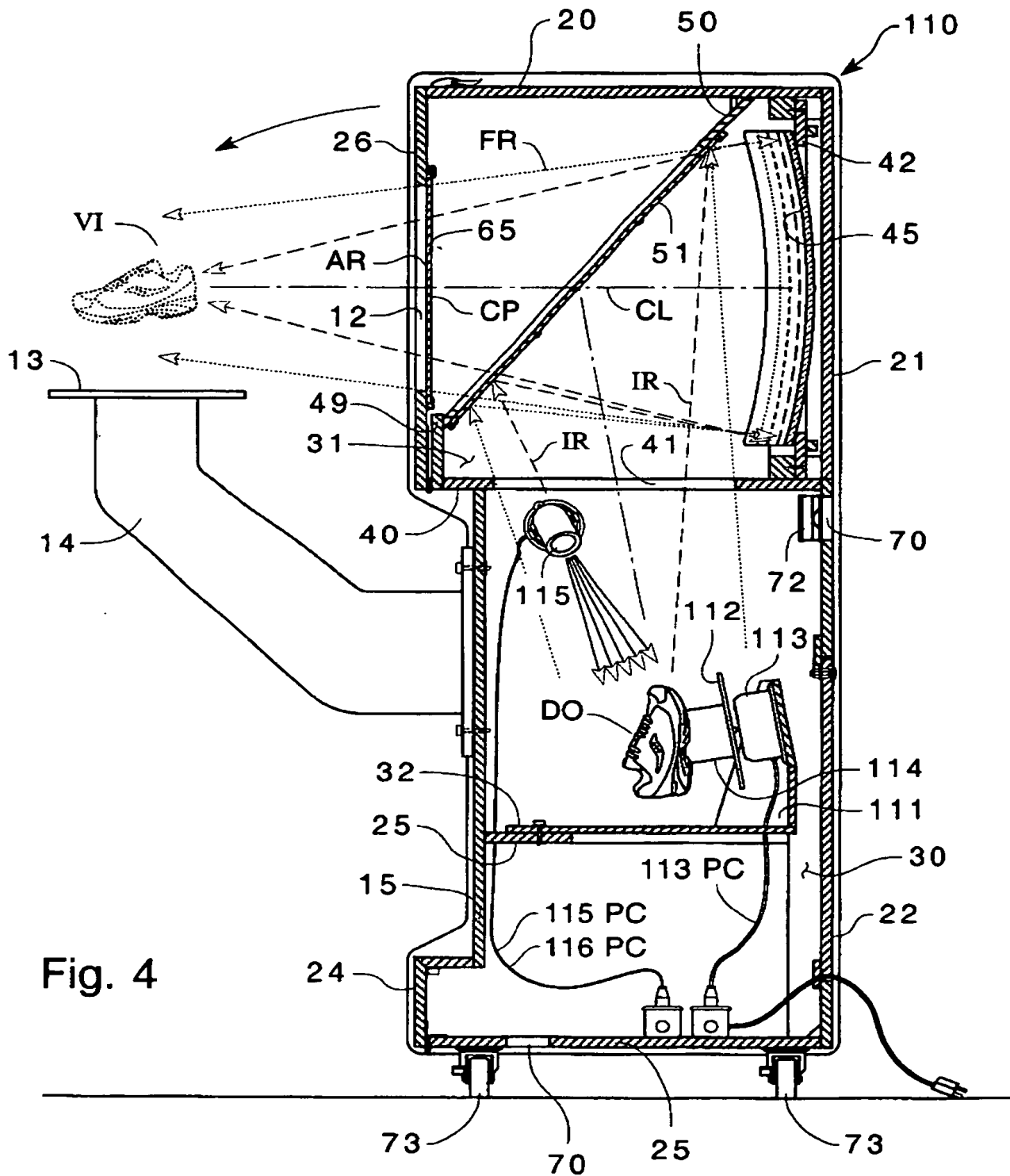
Fig. 3

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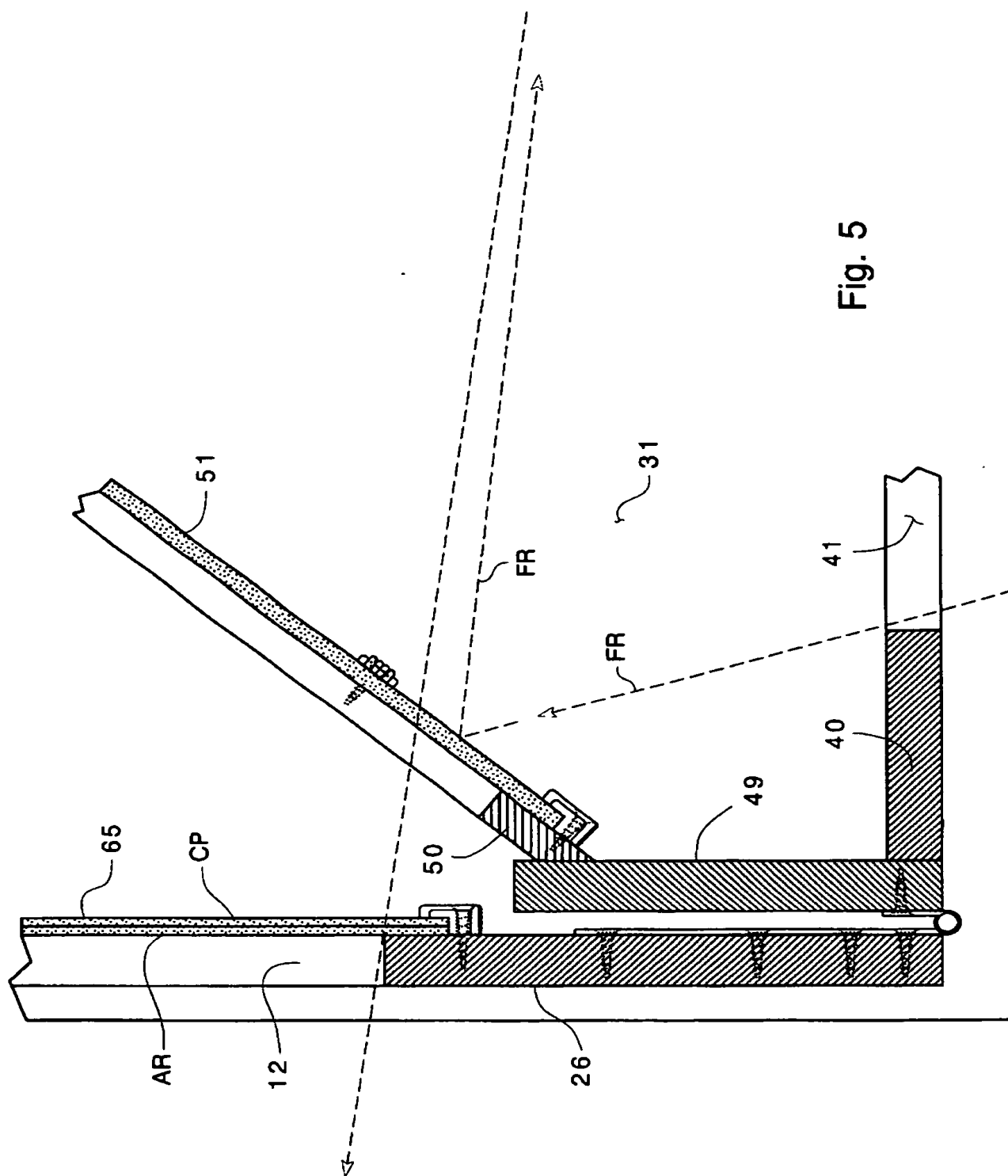


Fig. 5

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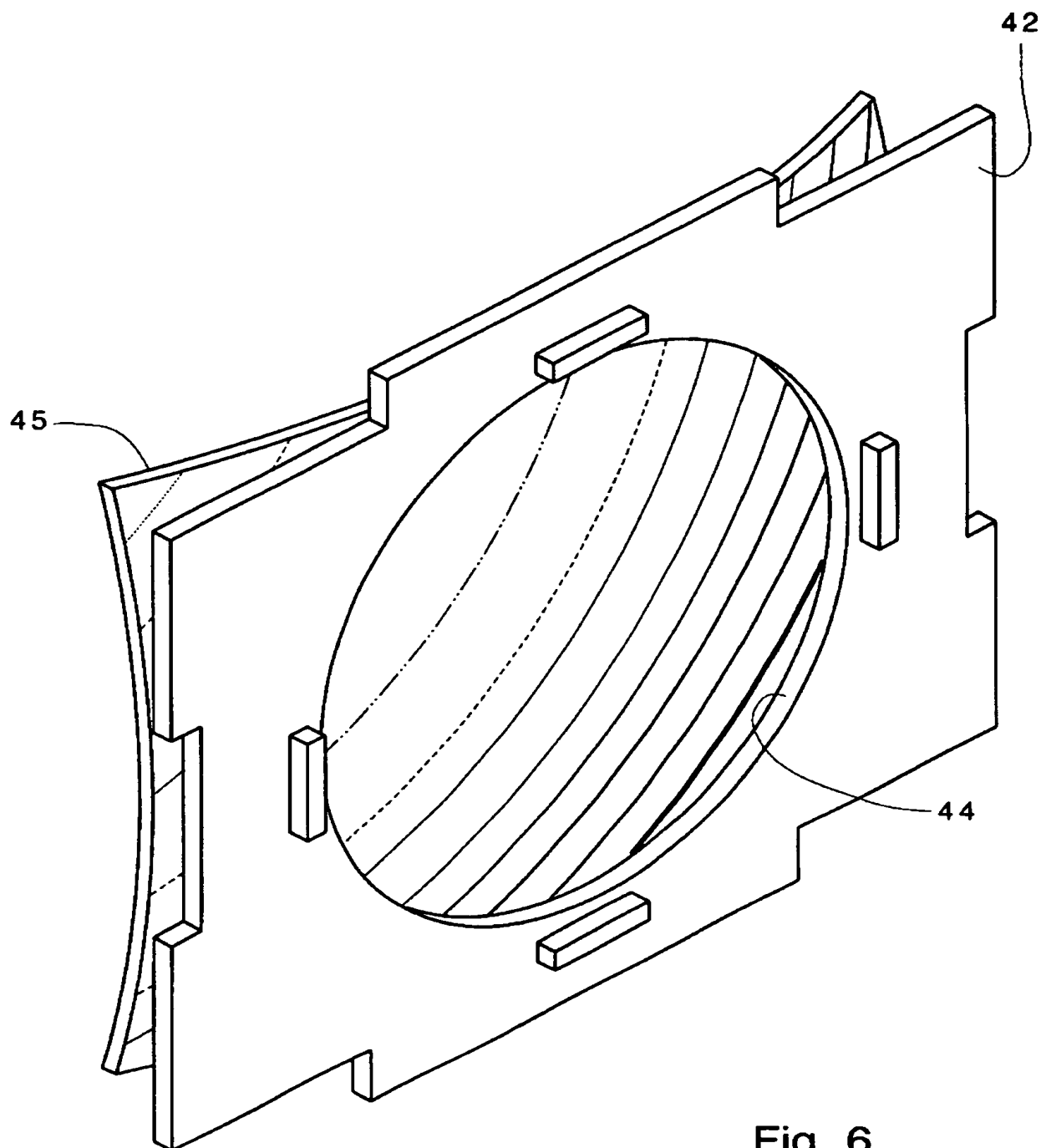
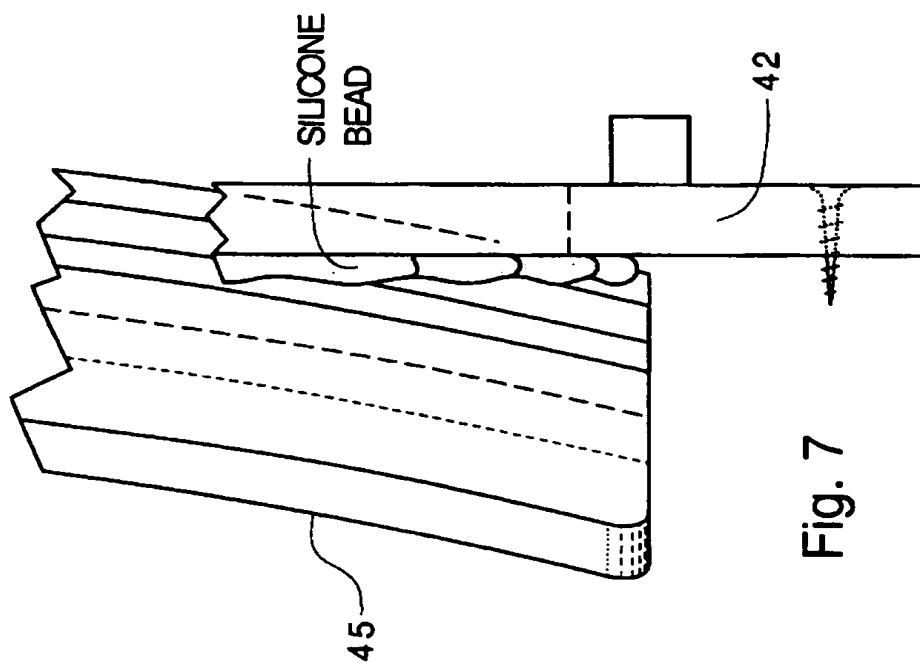
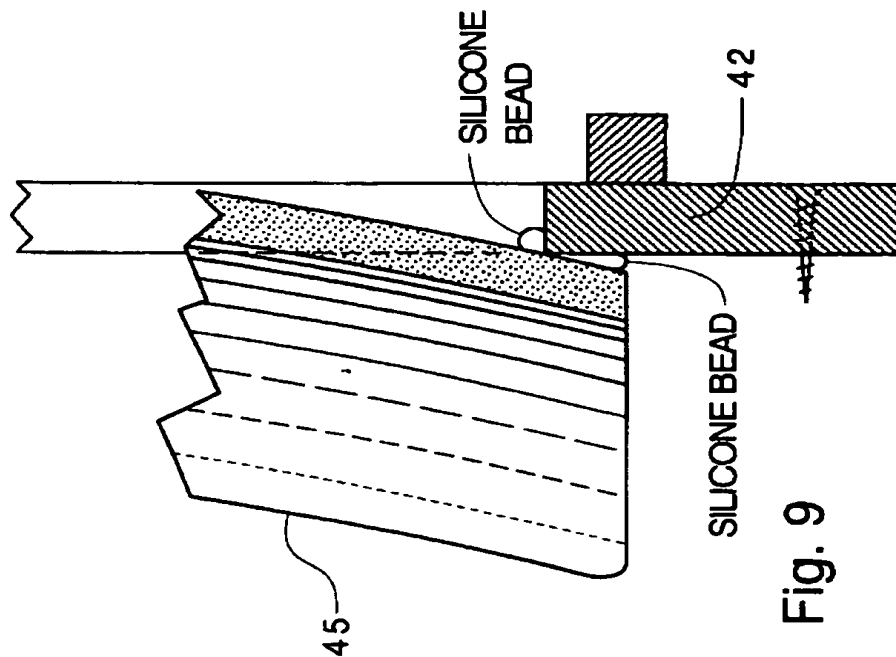


Fig. 6



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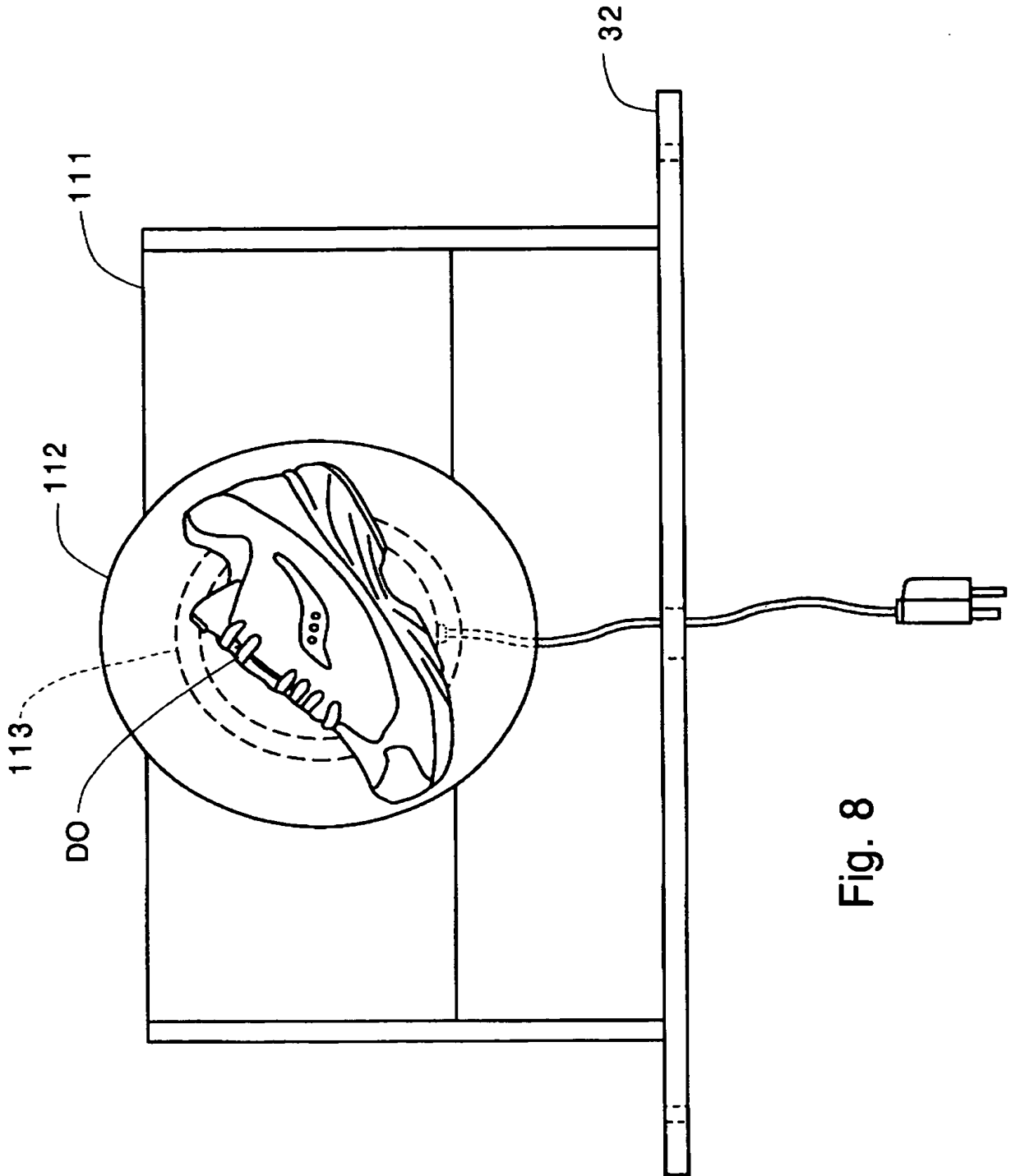


Fig. 8

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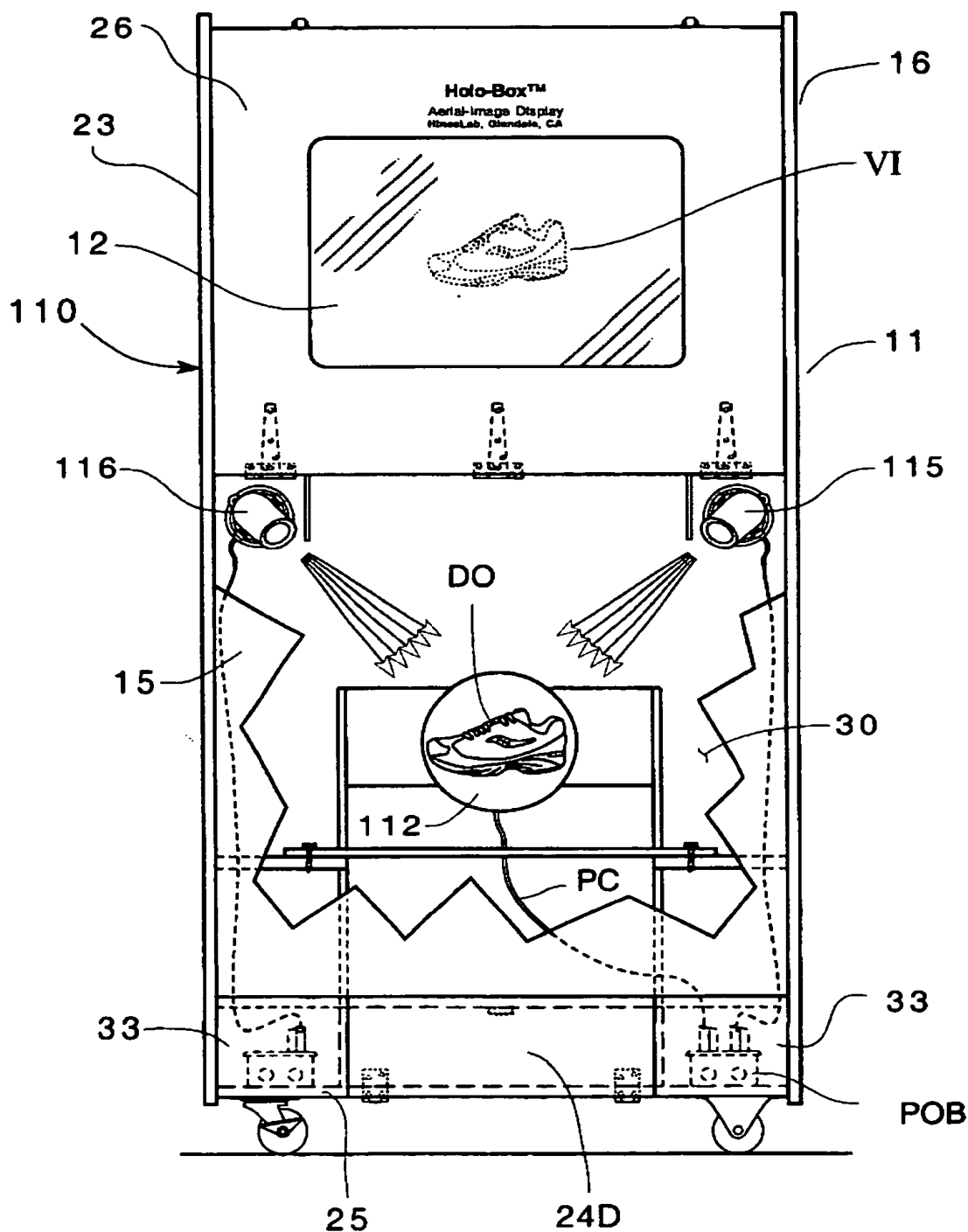


Fig. 10

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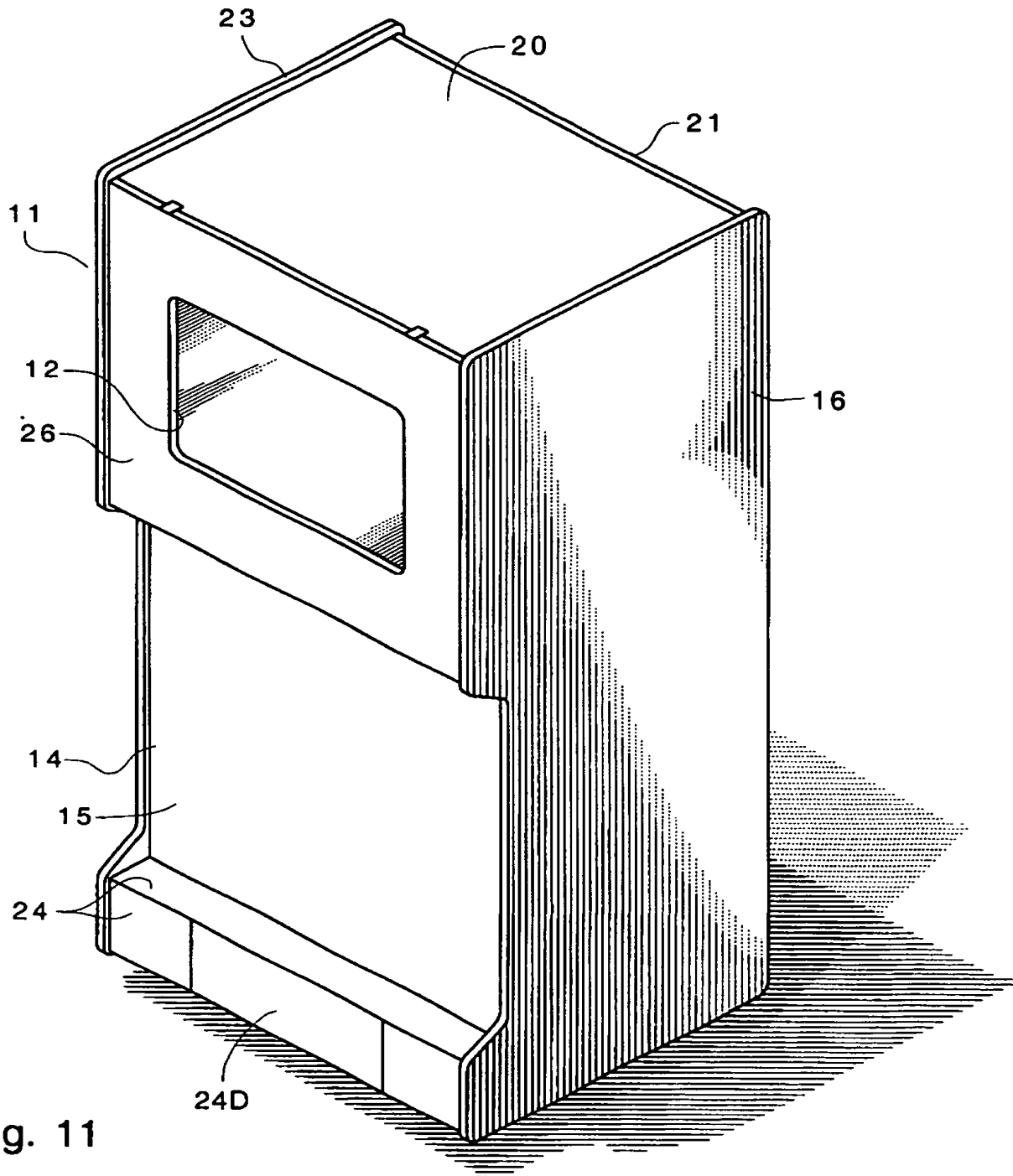


Fig. 11

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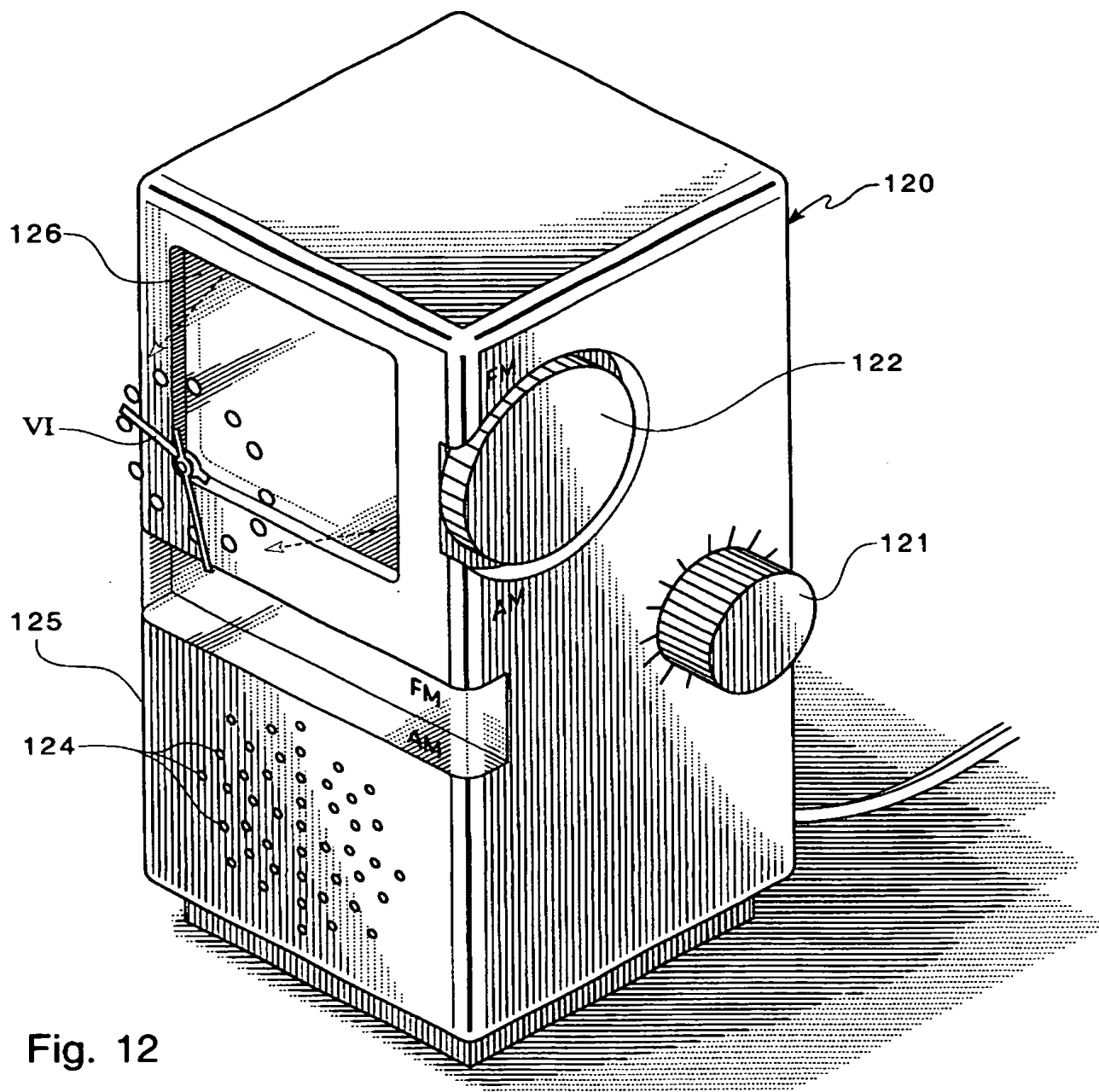


Fig. 12

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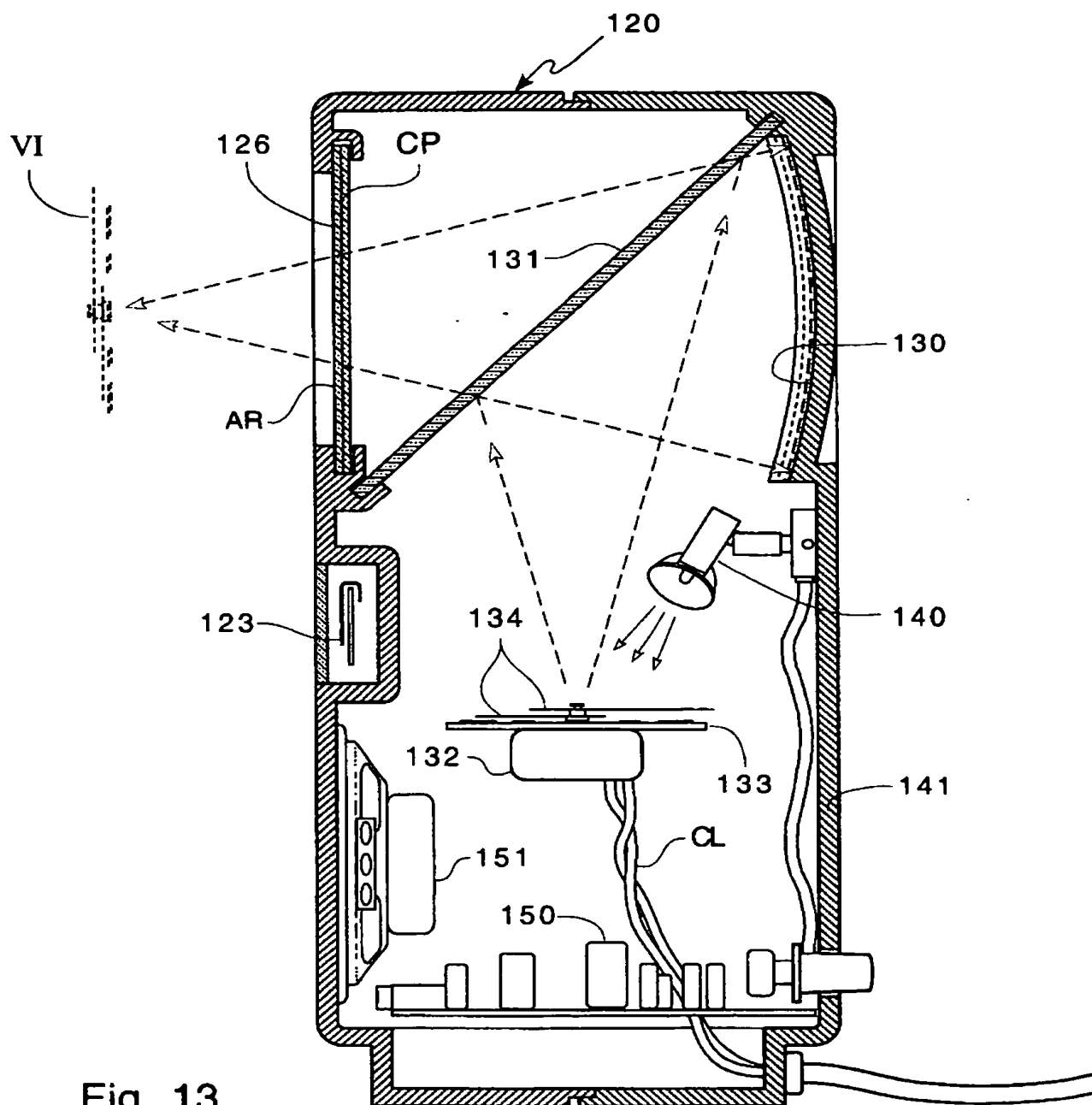


Fig. 13

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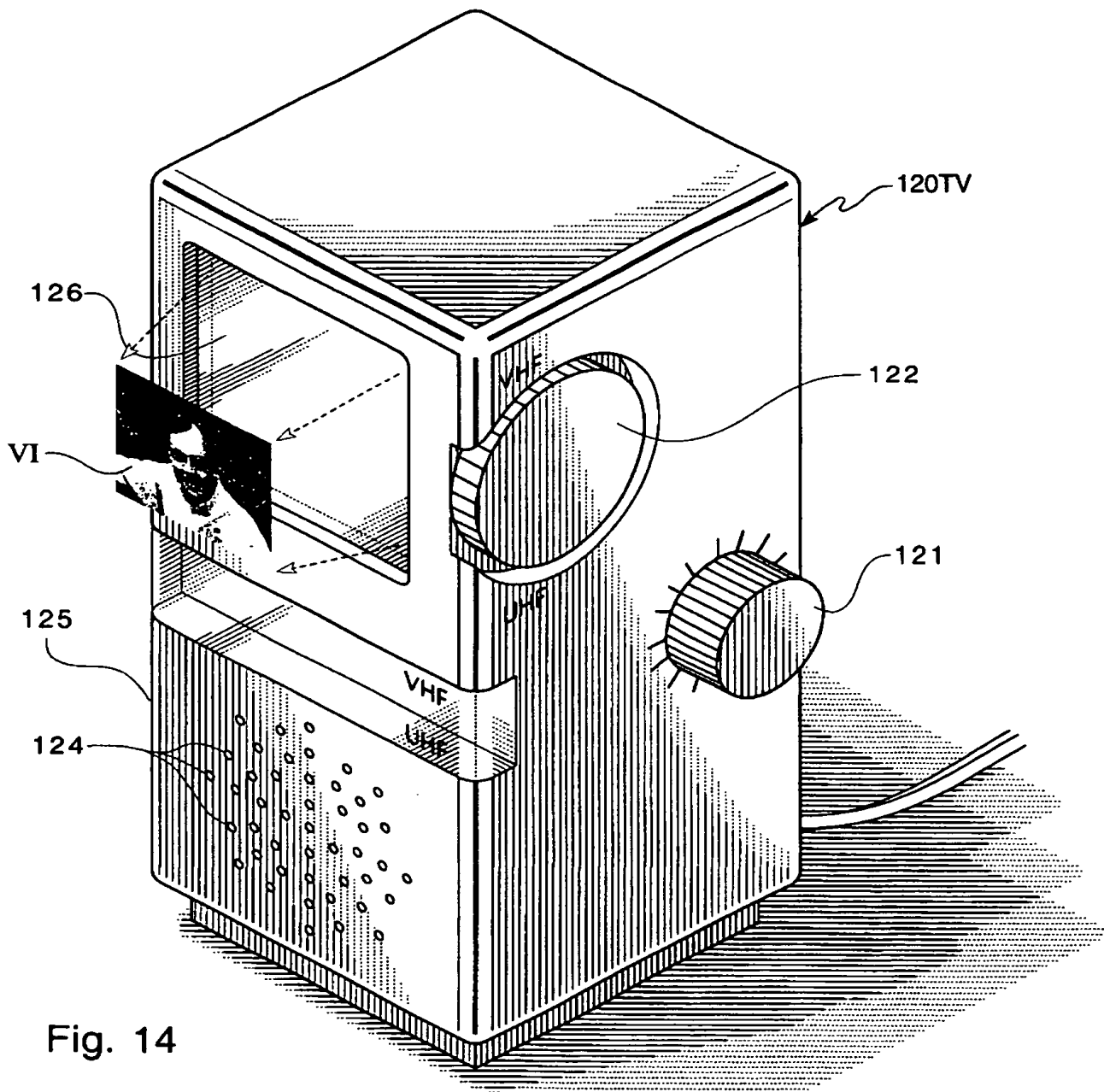


Fig. 14

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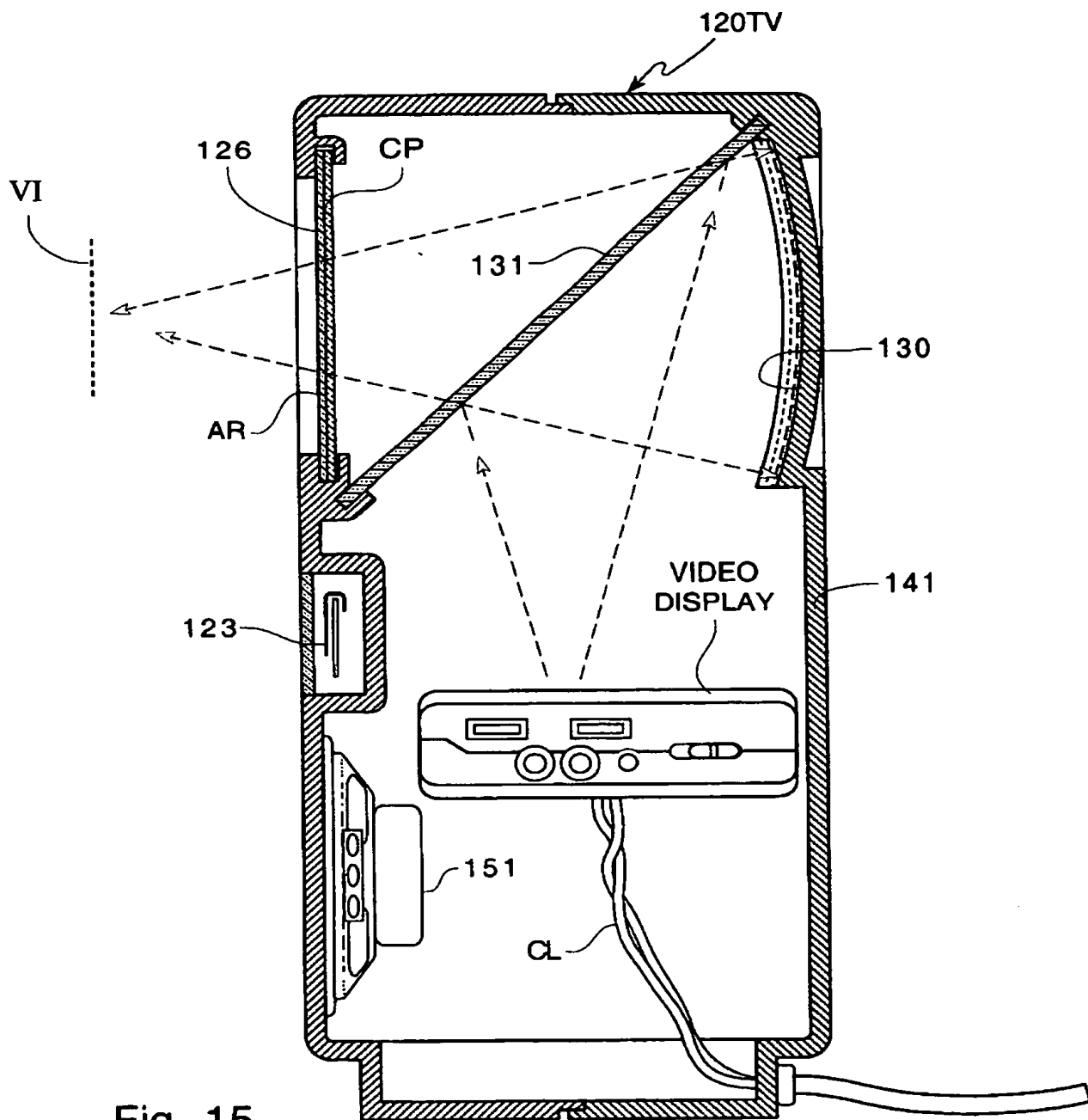


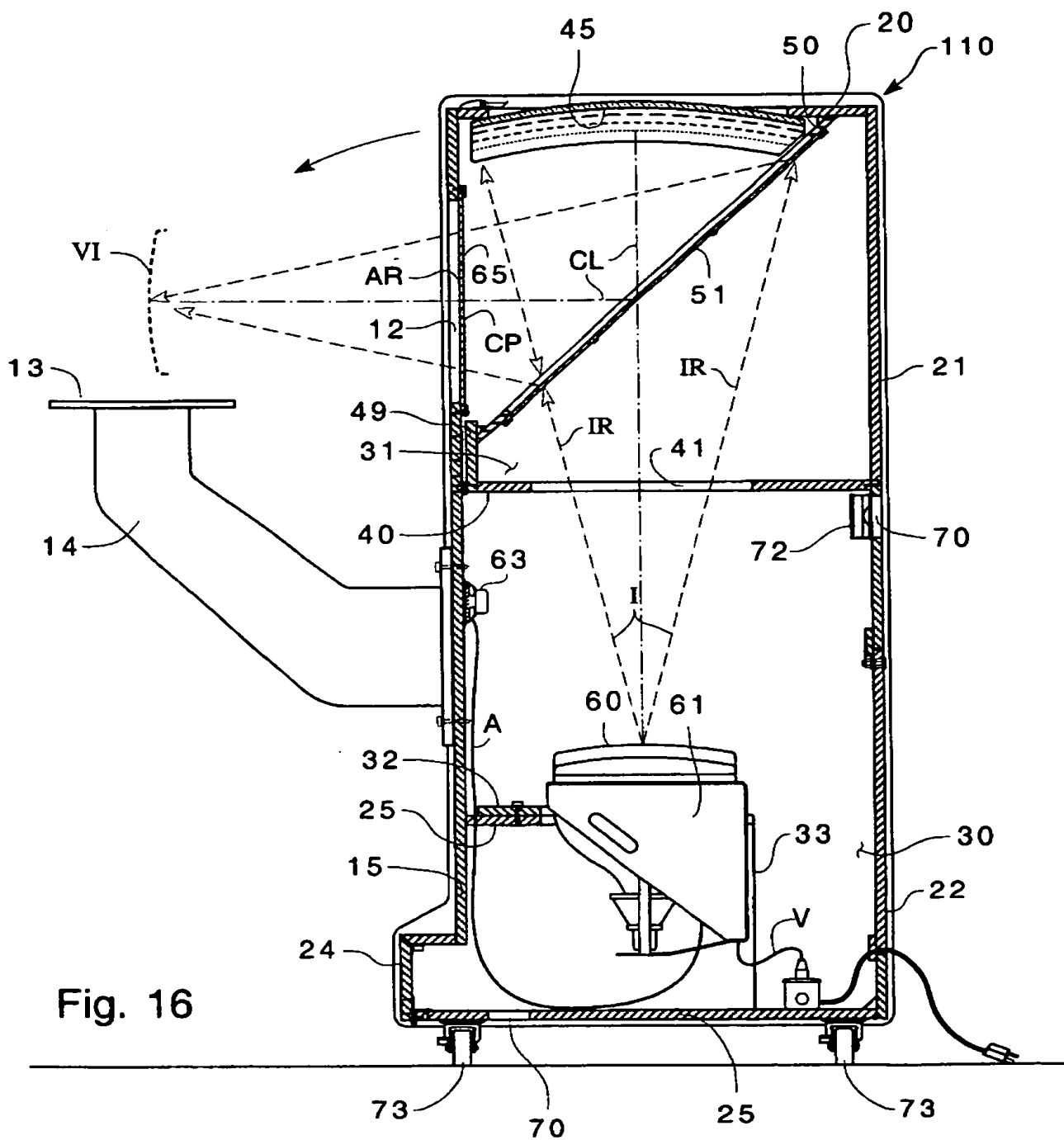
Fig. 15

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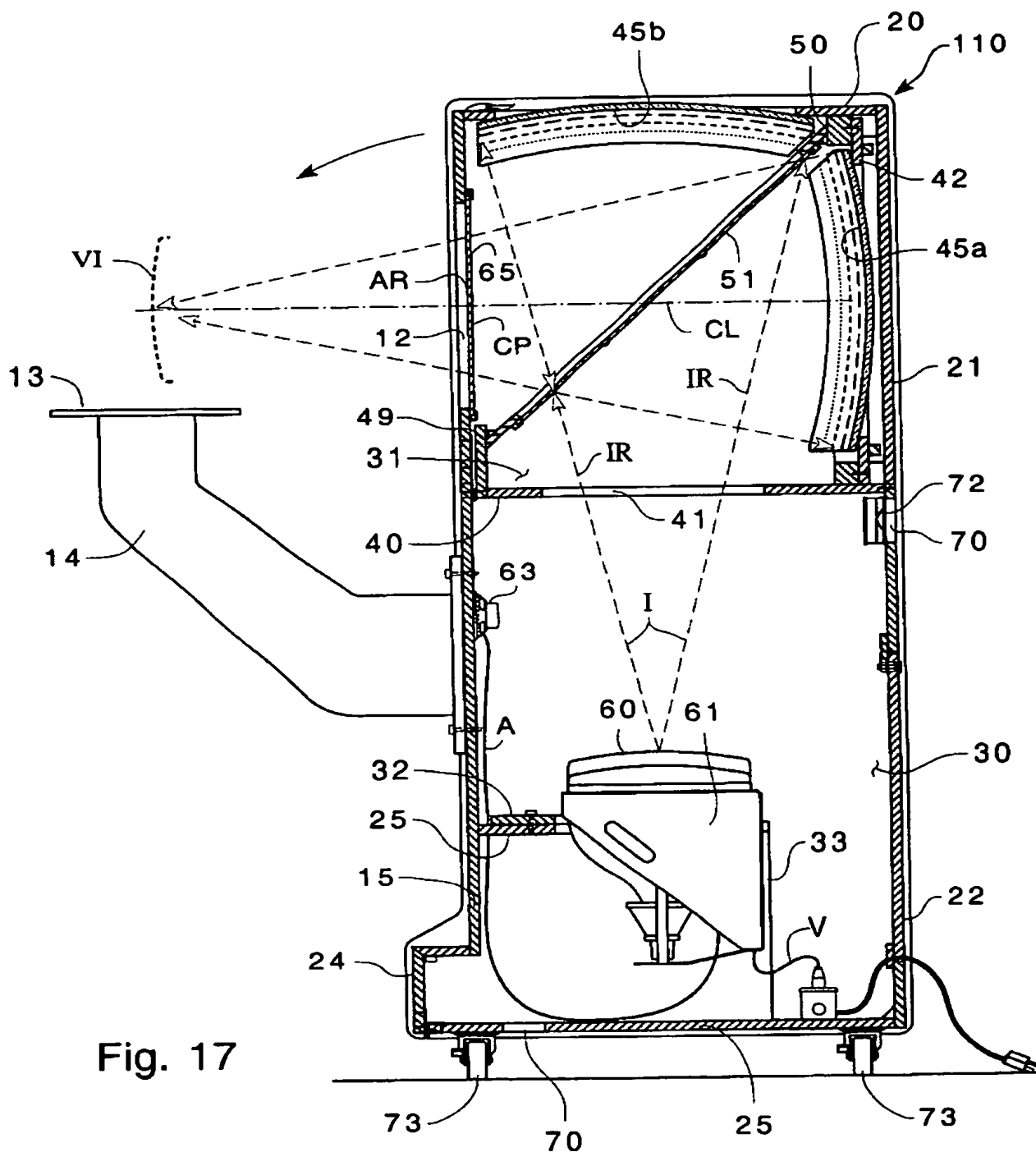


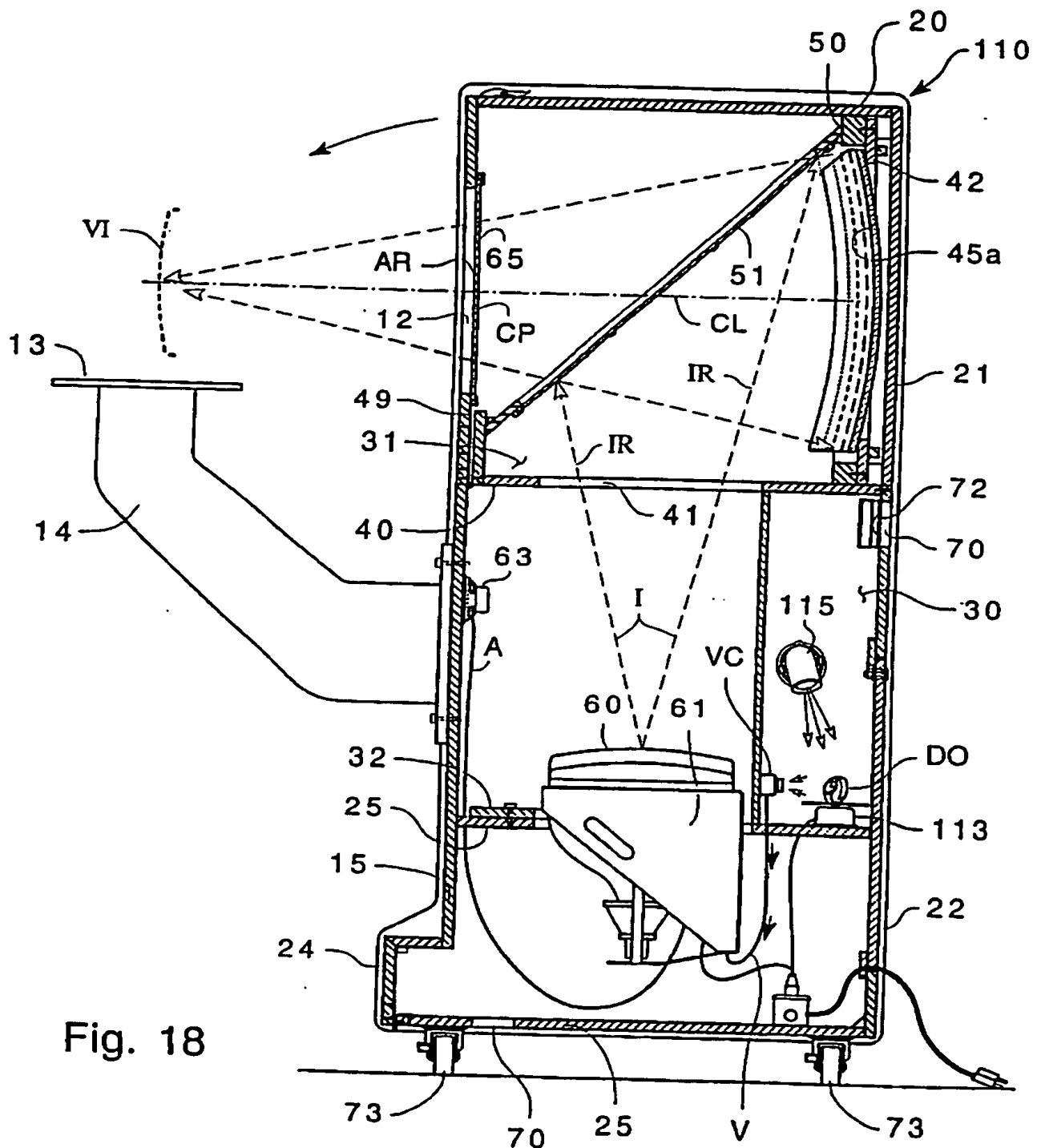
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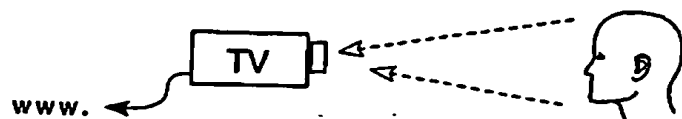


Fig. 19A

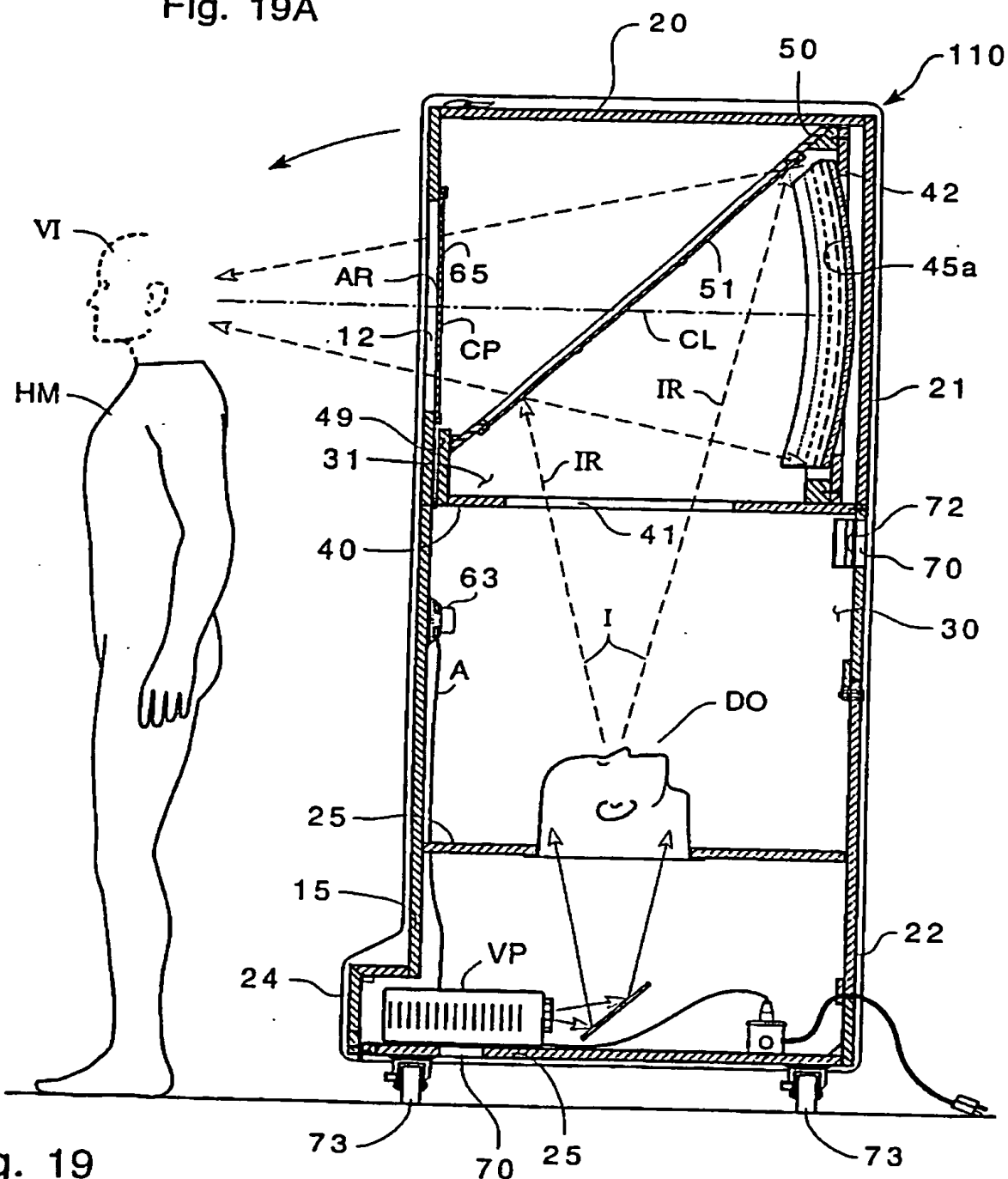


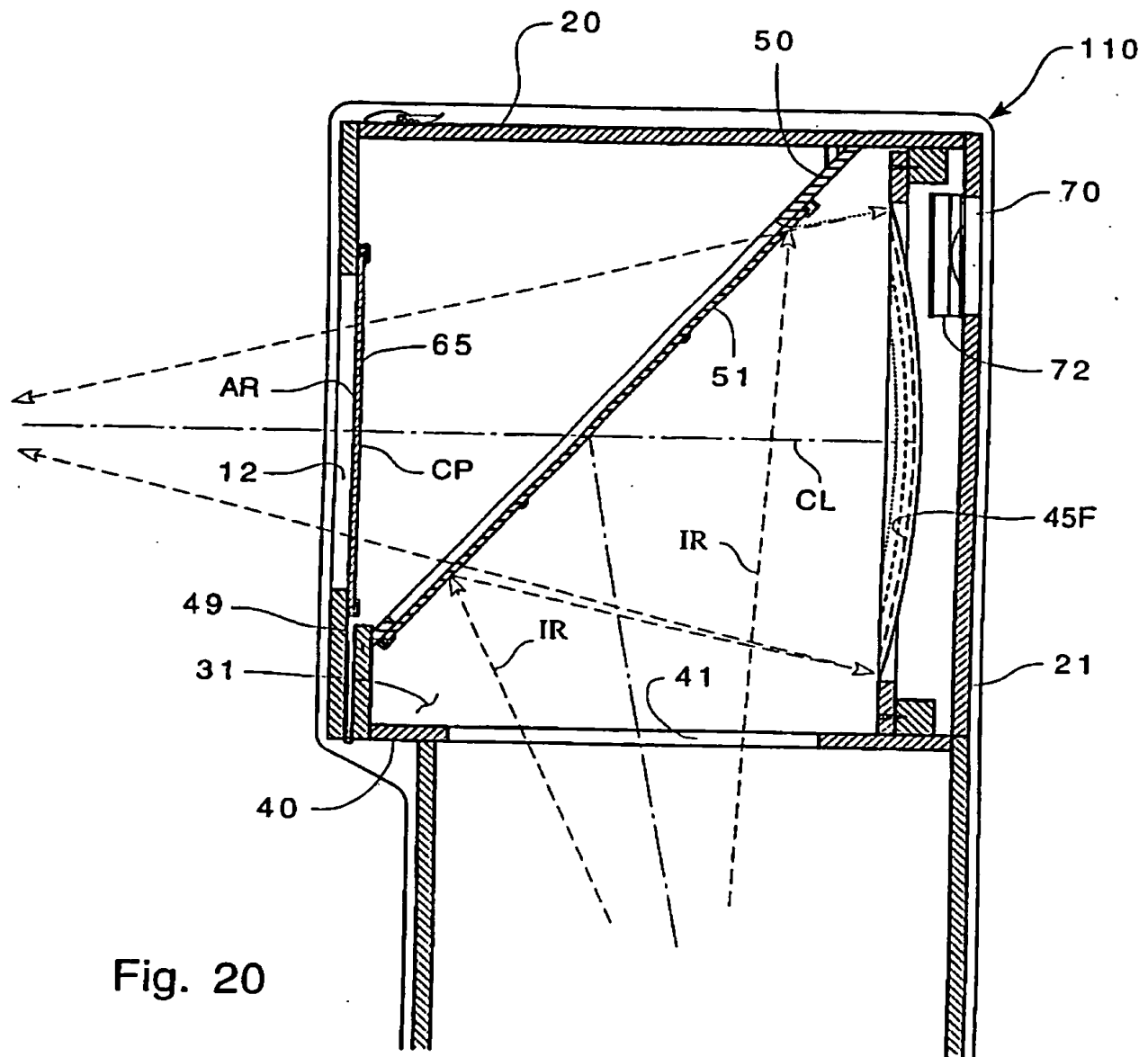
Fig. 19

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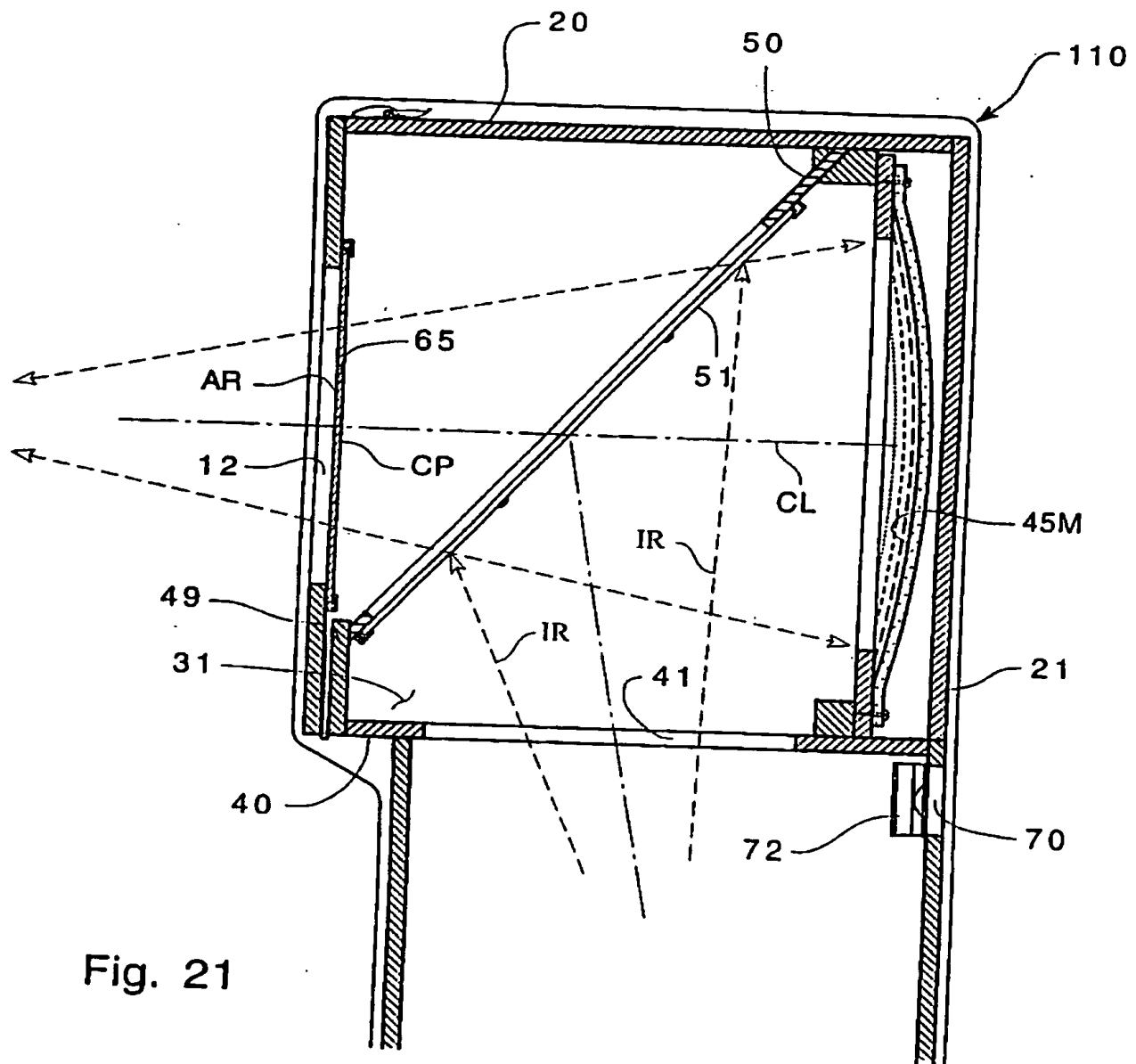


Fig. 21

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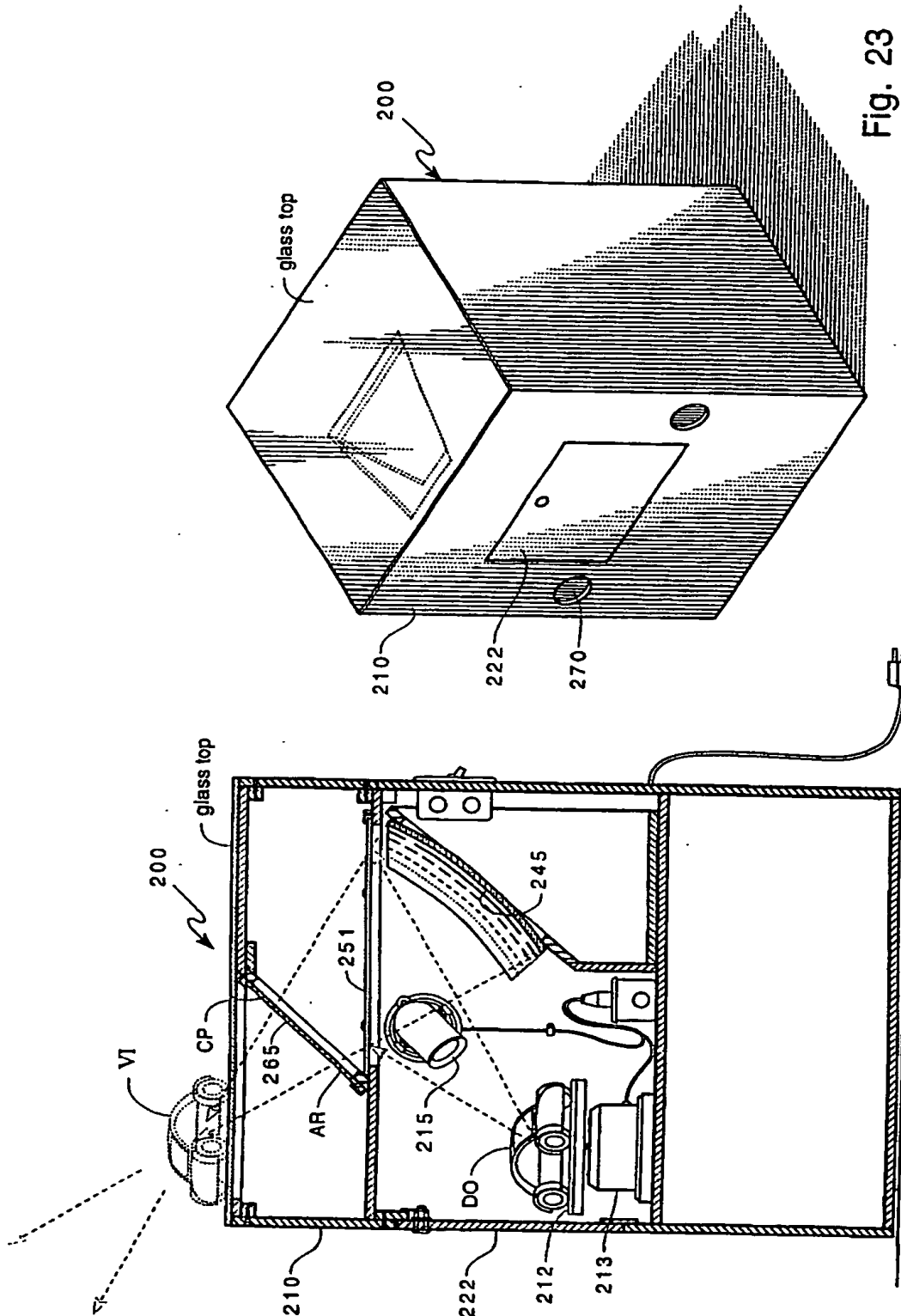


Fig. 23

Fig. 22